UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,386	03/26/2004	Herbert Hartgrove	03-336	8629

62753 7590 03/17/2009

VALERIE CALLOWAY
CHIEF INTELLECTUAL PROPERTY COUNSEL
POLYMER GROUP, INC.
9335 HARRIS CORNERS PARKWAY SUITE 300
CHARLOTTE, NC 28269

EXAMINER	
STEELE, JENNIFER A	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
03/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/810,386	HARTGROVE ET AL.	
	Examiner	Art Unit	
	JENNIFER STEELE	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *1-4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. **Claim 5-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Mater et al (WO 2003023108 referenced as US 2004/0198125) in view of Kelly (US 2002/0004348) and Rearick et al (US 6,491,727).** Mater teaches nonwoven flame barrier fabrics (ABST). Mater teaches preferred fiber blends are designed to withstand extended periods of time exposed to flame (ABST). Mater teaches that optionally, natural fibers can be included to improve product economics (ABST).

Mater teaches categories of fibers with respect to flame resistance and properties. Mater teaches category 1 fibers that are inherently fire resistant and resistant to shrinkage by a direct flame.

- Category 1 fibers include melamines, meta-aramids, para-aramids, polyamideimides, flame retardant viscose rayons (e.g. viscose rayon based fiber containing 30% aluminosilicate modified silica) [0023].
- Category 2 fibers are made from polymers with halogenated monomers and include modacrylics [0072].
- Category 3 fibers include low melt binders.
- Category 4 fibers include the natural fibers such as cotton, wool, silk.
- Category 5 fibers include non-flame retardant fibers that are synthetic such as nylons, polyesters, polyolefins, rayons, acrylics, cellulose acetates and polylactides.
- Category 6 fibers are halgenated binder resins [0075-0086].

Mater teaches blends of fibers, preferably to combine category 1 and 2 (para amids and modacrylics) because of synergistic charring effect [0094]. As amended claims recite the limitation that the layer chars rather than melts, Mater is also teaching this property. Mater teaches that one layer can be designed to provide emphasis of category 1 fibers and another layer to provide emphasis of category 2 fibers.

Mater teaches percentages of the categories of fibers:

- Category 1: 10-85% more preferably 30-60%,
- Category 2: 10-85%, more preferably 30-60%,
- Category 3: 0-30%, more preferably 10-20%, category 4: 0-40%,
- Categaory 5: 0-40%, more preferably 10-20%,
- Category 6: 0-40%, more preferably 10-20% [0087-0092].

Mater teaches blending of flame retardant fibers overcome disadvantages of previous fibers for example, hydroentangled nonwoven spunlace flame barriers containing significant amounts of p-aramid fibers impart a yellow color [0014]. Mater teaches a layered quilting panel that has a 1st, 2nd, 3rd, 4th and 5th layer of various blends of flame retardant fibers in the examples [0122-0135]. Further, Applicant is hydroentangling the two layers and ultimately the fabric layers would end up somewhat blended or mixed. Mater's blends encompass the claimed blended layers.

Mater differs from the current application and does not teach a lyocell fiber.

Mater differs from the current application and does not teach hydroentangling layers together.

Kelly teaches a hydroentangled nonwoven flame-retardant fabric consisting of a blend of melamine and aramid fibers. Kelly teaches a three dimensionally image transfer device for formation of the fabric (ABST). Kelly teaches this provides a fabric with air permeability and thermal protective properties. Kelly specifically teaches that while heat and flame resistant properties of aramid fibers are well known, fabrics produced using aramid fibers are heavy in weight and low in air permeability (col. 2, lines 54-64). Kelly teaches blending the aramid fibers with melamine fibers and use of three dimensional image transfer device to overcome the disadvantages of aramid fibers while still producing a flame retardant fabric.

Rearick teaches methods for reducing the flammability of cellulosic substrates (Title). Rearick teaches that cotton is a preferred cellulosic substrate for textiles and other cellulosic substrates include flax, jute, hemp, ramie, lyocell and regenerated

unsubstituted wood celluloses such as rayon (col. 4, lines 61-63). Rearick teaches blends of cotton and other fibers such as modacrylics, rayons and lyocell.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ blends of fire resistant fibers with natural fibers and layers with differing blends as taught by Mater. Rearick presents a finding that one of ordinary skill in the art could have substituted lyocell for the cotton or a rayon fiber of Mater with a reasonable expectation of success. It further would have been obvious to employ the technique hydroentangling the fibers to produce a flame retardant fabric suitable for use bedding and mattress covers as taught by Kelly.

As to claims 13 and 14, Mater teaches high loft nonwoven layers that have basis weights in the range of 75 to 600 gsm which is equal to 2.2 oz/yd^2 to 17 oz/yd^2. Mater teaches the varying the basis weights and thickness of the highloft layers to achieve the desired fabric with required flame barrier effect [0114]. Mater teaches the embodiments wherein each of the layers is in the range of 75 to 600 gsm where one layer has a basis weight of 153 gsm and the other layer has a basis weight of 229 gsm. Therefore it would have been obvious to employ two layers, one with a basis weight of 2 oz/yd^2 and the other with a basis weight of 4 oz/yd^2.

As to claims 15 and 16, Mater teaches a preferred embodiment is a thermally bonded nonwoven highloft flame barrier for use in mattress, upholstered furniture, fiber-filled bed clothing and transportation seating applications is produced by making an intimate staple fiber blend from category 1 and 2 optionally adding fibers from all categories 3,4 and 5 [0022]. Mater teaches the fiber can be staple fiber and staple fiber

blends. Further Kelly, teaches carded staple fiber blends of melamine and aramid fibers hydroentangled (col. 2, lines 63-67 and col. 3, lines 1-5). It would have been obvious to employ a staple length fiber motivated to produce a flame retardant nonwoven as taught by Mater and Kelly.

As to claims 17 and 18, Mater teaches the nonwoven fabric layers can have basis weights of 40 gsm through 1800 gsm. Preferably the basis weights from 75 to 600 gsm. Preferably, 75 gsm is representative of some of the preferred ranges of the present application (page 24).

Response to Arguments

2. Applicant's amendments and arguments filed 12/11/2008 have been fully considered but they are not persuasive. The 35 USC 103(a) rejection over Mater in view of Kelly and Rearick is maintained. Applicants amended independent claim 5 and claim 6 to limit the blend of fibers to consisting of lyocell fibers and modacrylic fibers and consisting of lyocell fibers and modacrylic fibers and para-amid fibers. Applicants submitted NPL that was called an Affidavit, however it is in the form of NPL. The NPL that presents literature on lyocell fibers and how they are made and used as substitutes for cotton and polymer because the lyocell has different properties that cotton and polyester. The 35 USC 103(a) rejection and reference to Rearick showa that lyocell is a fiber known in the art and known in the art to be substituted for cotton and other fibers. The NPL does not present evidence of how the lyocell fiber employed in the current invention has produced an unexpected result that would show one of ordinary skill in the

art the substitution of lyocell fibers for cotton or other synthetic fibers would not be obvious.

Applicant argues that the viscose rayon fibers, Visil.TM, of Mater are not equated with the lyocell as claimed because the Visil.TM fibers have an aluminosilicate FR component. Examiner has removed the statement that the modified flame retardant viscose rayon of Mater is equated with the lyocell claimed and is relying on Rearick to teach that lyocell is a known substitute for cellulosic fibers such as cotton and rayons.

Applicant states that Mater does not disclose a viscose rayon *per se* and instead teaches use of Visil.TM. Mater does teach rayon can be used as a Category 5, synthetic non flame retardant fiber. However, it is understood from the disclosure and the Affidavit that the lyocell of the current Applicant is not equated with viscose rayon.

3. Applicant argues that the reference to Kelly in the "background of invention" which discloses three to seven layers hydroentangled together but Kelly also teaches these inventions produced unsatisfactory results. Kelly is relied upon for teaching that the technique of hydroentangling one or more layers is known in the art. Applicant argues that Kelly teaches fiber blends of melamine and aramid but not the blend of lyocell and modacrylic fibers. The statement that Kelly teaches fiber blends of melamine and aramid but not the specific blend of the invention, shows that it is known in the art to produce a flame retardant fabric by hydroentangling. Mater in view of Rearick is relied upon for teaching that it would have been obvious to employ the blends of fibers as claimed.

4. Applicant's arguments that the claims recite "consisting" of lyocel and thus does not encompass FR coated substrate fibers. Rearick is relied upon for teaching that it is known in the art to substitute lyocell for cotton, viscose rayon and other cellulosic fibers. Rearick teaches lyocell is cellulose substrate such as cotton, rayon, flax, jute, ramie and hemp. Mater teaches use of cotton and rayon. Rearick is not relied upon for teaching the lyocell fibers are FR coated. Mater teaches the blends include non-FR fibers such as polyester, rayon, cotton, acrylics, cellulose acetates and nylons (pages 14 and 15). Mater does not teach FR coating of fibers. In fact, Mater teaches that blends are useful to overcome prior art disadvantages of FR coated fibers. Mater presents a finding that one of ordinary skill in the art could have employed blends of inherently FR fibers with non FR fibers of synthetic and natural compositions and the results would have been predictable in producing a flame resistant layered fabric. While Mater does not list lyocell as one of the synthetic or natural fibers useful in the blends, Rearick teaches that lyocell is a known substitute for cotton or rayon. Examiner is referring to the rayon fiber listed in Mater under non flame retardant synthetic fibers.

Rearick teaches that it is desirable to produce a cellulosic based fabric that has the desirable properties of a cellulosic fabric but also has flame resistance properties. Rearick teaches the technique of applying an FR coating to achieve the flame resistant properties. Mater is teaching blending of inherently FR fibers with non FR fibers can achieve a similar result of producing a fabric with flame resistance. The claim limitation that "consisting" of lyocell would exclude the coated fiber of Rearick is not applicable in the context of this rejection. The combination of Mater which teaches blending of FR

fibers and natural and synthetic fibers and Rearick which teaches that lyocell is a known substitute for cotton present findings that one of ordinary skill in the art could have combined the known elements and the results of the combination would have been predictable. The burden is on the Applicant to show that the results of the combination produce an unexpected result.

In addition, Applicant is hydroentangling the two layers and ultimately the fabric layers would end up somewhat blended or mixed and limitation "consisting of" is not relevant or exclusive to the individual layers.

5. Applicant argues that Mater does not teach, suggest or predict success in solving the yellowing discoloration or para-amid fiber in one nonwoven layer in one nonwoven layer of a multilayered flame retardant barrier. Mater lists disadvantages of prior art flame retardant fabrics (pages 3 and 4). Mater teaches the disadvantages of coated fibers as mentioned in the paragraph above and teaches that prior art spunlace flame barriers containing 100% para-amid fiber impart a yellow color to the flame barrier. Mater's invention is intended to overcome or conspicuously ameliorate the disadvantages of the prior art (page 4). Mater teaches using blends of fibers that produces a synergistic effect when catagory 1 fibers, such as para-amid are combined with catagory 2 fibers such as modacrylic. Mater teaches other components such as the natural and synthetic fibers can be used to improve economics (ABST). Therefore the Applicant's invention wherein the para-amid component is used in only one layer and in a lesser amount than the other fibers is consistent with Mater's teaching the

blending the fibers will produce a flame retardant fabric and overcome the disadvantage of yellowing.

6. Applicant argues that the reference to Cooke is representative a single flame barrier layer and not a two layer flame barrier as claimed. Examiner's reference to Cooke in the prior Office Action Response to Arguments was to cite that it is known in the art the modacrylic inherently has the property where the fibers char. The Applicant amended the previous claims (6/11/2008) to include the limitation "wherein the first layer form a char rather than melt when burned". Mater teaches the blends which produce a char (ABST) and blends wherein the category 2 fibers (modacrylic included) produce oxygen depleting gases which also coat and protect the char (page 15 and 16). Applicant's claim limitation is an inherent property of the fabric and an inherent property that is known in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER STEELE whose telephone number is (571)272-7115. The examiner can normally be reached on Office Hours Mon-Fri 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./ /Elizabeth M. Cole/

Examiner, Art Unit 1794 Primary Examiner, Art Unit 1794

3/11/2009